Additional file 1 for:

Single-cell atlas of human urine-derived stem cell chondrogenesis establishes a non-invasive, xeno-free platform for translational cartilage research

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Keywords:

single-cell RNA sequencing, urine-derived stem cells, chondrogenesis, xeno-free culture, cartilage biology, skeletal dysplasia modeling, translational regenerative medicine, disease modelling, tissue engineering, adult stem cells

Supplementary Figures

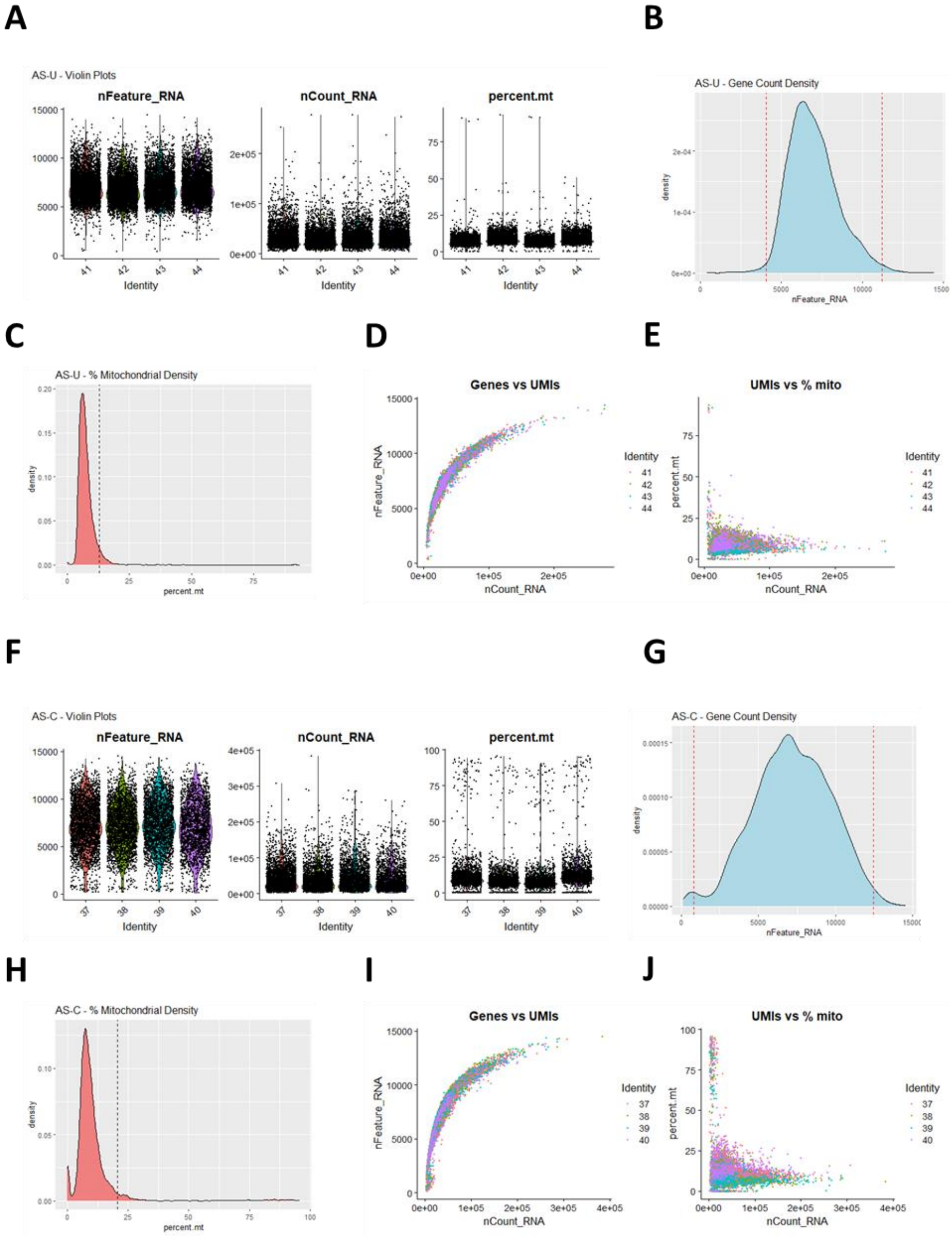

Figure S1: Quality control of single cell RNA-Sequencing data.
Panels A–E (AS U= undifferentiated) and F–J (AS C= chondrogenic) show the same set of QC visualizations for each condition.
(A/F) Violin plots of detected genes per cell (nFeature_RNA), UMI counts per cell (nCount_RNA), and percent mitochondrial reads (percent.mt).
(B/G) Density of detected genes with dashed lines marking the 1st and 99th percentile thresholds.
(C/H) Density of percent mitochondrial reads with a dashed line at the 95th percentile threshold.
(D/I) Scatter of UMI counts vs. detected genes, illustrating library complexity.
(E/J) Scatter of UMI counts vs. percent mitochondrial reads, highlighting high mt cells.

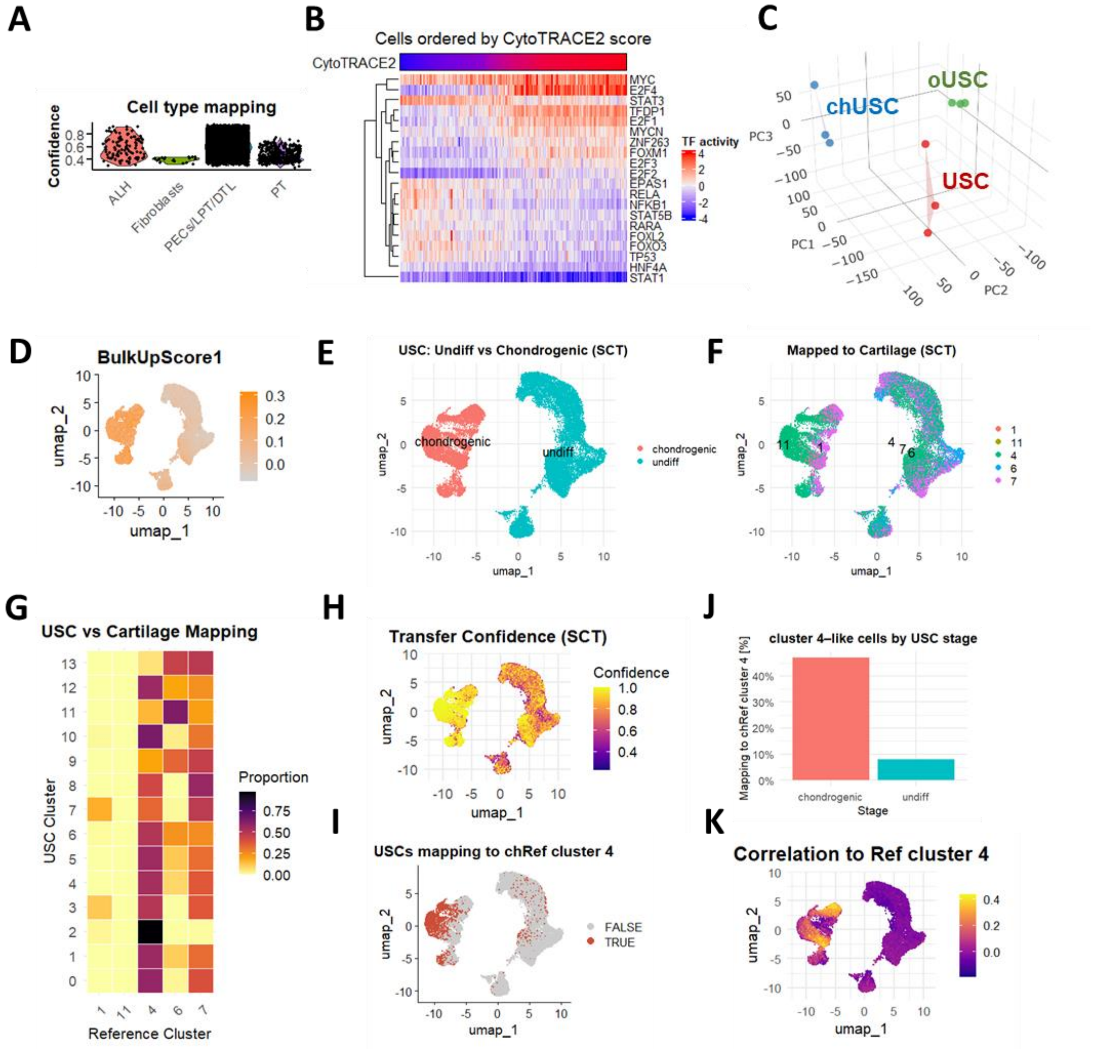

Figure S2. Supporting information for computational analysis.
(A) Violin plot showing predicted cell types for undifferentiated USCs.
(B) Top 20 stemness-related transcription factor heatmap.
(C) 3D-PCA of differentiated and undifferentiated replicates.
(D) BulkUpScore reflecting upregulated genes in bulk RNA-sequencing, highlighted in the merged undifferentiated and chondrogenic USC Seurat object.
(E) UMAP of the merged object with cell type annotations.
(F) Merged UMAP mapped to a cartilage reference sample, highlighting predicted reference labels.
(G) Heatmap visualizing mapping proportions of the merged USC object to the reference objects.
(H) UMAP of the merged object with transfer-confidence color gradient.
(I) UMAP of the merged object highlighting cells with mapping confidence to the chondrocyte reference cluster > 0.7.
(J) Fraction of cells mapping to the reference cluster across stages.
(K) Correlation values with the reference cluster mapped onto the merged UMAP.

A

Culture medium

Component	Concentration
Alphamem	89 %
Antibiotic	1 %
Human Serum	10 %
FGF2	5 ng/mL

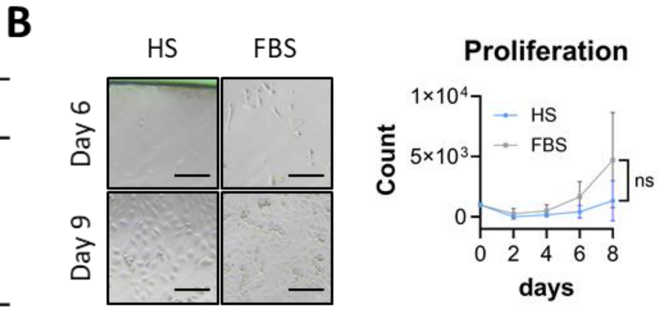

Figure S3. Expansion of USCs under HS conditions.
(A) Medium recipe for USC expansion using autologous serum.
(B) Representative images of colonies emerging under HS or FBS expansion at day 6 and day 9.
(C) Proliferation curves of HS- or FBS-expanded USCs (n = 3).